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STATE DOCUMENTS

REPORT
OF THE
**Montana Livestock
Sanitary Board**
AND
State Veterinary Surgeon



Including Reports of Chemist and Bacteriologist and
Pathologist and Summary of Work

For the Biennium

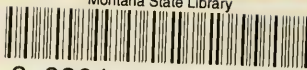
December 1, 1930, to November 30, 1932

VOLUME I.

NUMBER 14



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Montana Livestock Sanitary Board

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Secretary and Executive Officer

State Veterinary Surgeon

Director of Laboratories

VOLUME I

NUMBER 14



Montana Livestock Sanitary Board Laboratories

Helena, Montana,
December 1, 1932.

Honorable J. E. Erickson,
Governor of the State of Montana,
Helena, Montana.

Sir:

In compliance with Section 3292, Revised Codes of Montana, 1921, we transmit herewith the report of the Montana Livestock Sanitary Board and the State Veterinary Surgeon for the biennium December 1, 1930, to November 30, 1932.

Respectfully,

MONTANA LIVESTOCK SANITARY BOARD.

W. J. Butler, Executive Officer.

REPORT OF THE Montana Livestock Sanitary Board

Helena, Montana,
December 1, 1932.

Honorable Livestock Sanitary Board,
Helena, Montana.

Sirs:

In compliance with Section 3292, Revised Codes of Montana, 1921, there is herewith presented the report of the State Veterinary Surgeon and Executive Officer of the Montana Livestock Sanitary Board for the biennium December 1, 1930, to November 30, 1932.

There were five meetings of the Livestock Sanitary Board held during the year 1931.

The first meeting was held at Helena, Montana, on Tuesday, January 13th; the second meeting, which was the regular annual meeting, was held at Helena, Montana, on Wednesday, April 15th; the third meeting was held at Bozeman, Montana, on Thursday, May 7th; the fourth meeting was held at Helena, Montana, on Wednesday, June 24th and the fifth meeting was held at Helena, Montana, on August 19th.

There were two meetings of the Livestock Sanitary Board held during the year 1932; the annual meeting of the Board was held at the State Capitol, Helena, Montana, on April 4th, and the second meeting was held at the State Capitol, Helena, Montana, on Wednesday, November 16th, 1932.

At these various meetings matters of importance to the livestock industry were discussed and acted upon. All actions, regulations or orders promulgated by the Executive Officer were approved by the Board. Complete minutes of all meetings are on file in the Secretary's office at Helena, Montana.

LIVESTOCK SANITARY BOARD

It is unfortunate that this Department may not seek publicity for the work that it accomplishes. Publicity, while it might gain the Board more recognition, would undoubtedly render its work more difficult of accomplishment and might be productive of unwarranted financial difficulties and unnecessary trade restrictions.

On account of depressed conditions that exist throughout the nation and the outlook for decreased appropriations, we feel that it is not amiss, however, at this time to cite in a concrete manner some of the accomplishments of this Board.

The members of the Livestock Sanitary Board are appointed by the Governor. They act without compensation, receive no emoluments of any kind but are entitled to their actual traveling and subsistence expenses, if such a claim is presented. The total amount of expense money paid to members of the Livestock Sanitary Board from 1921, when the Act creating the present Board was passed, to the present date, November 30th, 1932, amounts to \$107.46. We doubt if there is a Board in existence in this or any other part of the world that has operated for 12 years on \$107.46, and we doubt if any Board has ever given a more efficient and conscientious service than the Livestock Sanitary Board of Montana.

The Board appoints its Executive Officer who acts as the State Veterinary Surgeon without additional compensation, and the Executive Officer appoints his deputies with the approval of the Board. The executive Officer and the Livestock Sanitary Board corps are the only ones that receive compensation.

Inasmuch as this Board of livestock men give their time without compensation it follows that they watch the operations of their employes very carefully and that they supervise the expenditures of monies with a just and discriminating eye. A financial statement of the operations of the Livestock Sanitary Board corps is forwarded each month by the Executive Officer to the members of the Board. Likewise a news letter of livestock disease conditions found in the various parts of the State and methods for the control and eradication of such disease is forwarded each month to the members of the Board and to every member of the Livestock Sanitary Board corps. In this way the Board is kept conversant with the expenditures and the Board and their corps are kept conversant with disease conditions existing in the State.

The instructions of the Board to their Executive Officer are:

"TO GET THE MOST POSSIBLE SERVICE OUT OF EVERY DOLLAR EXPENDED AND TO KEEP EXPENDITURES AT ALL TIMES AT AS LOW A FIGURE AS IS CONSISTENT WITH EFFICIENT, ADEQUATE AND USEFUL SERVICE TO THE LIVESTOCK INDUSTRY AND THE STATE OF MONTANA."

That this has been accomplished is demonstrated by the remarkable freedom of our livestock from disease. Montana is the third largest state in the Union. It is true that Montana does not have a large human population but this Board does not deal with human beings, it deals with livestock, and Montana has one of the largest livestock populations in the United States. There are very few, if any, states that appropriate a lesser amount of money for the control of livestock diseases, poultry diseases and supervision of milk and cream production than does the State of Montana. One state with a livestock population comparable with that of Montana has expended in the past 15 years upwards of fifty

million dollars in the control of Bovine Tuberculosis alone, not to mention additional expenditures for the control of other livestock diseases, poultry diseases and the supervision of milk and cream production.

It is because of the Montana Livestock Sanitary Board and the Legislatures of the State of Montana fore-seeing the necessity of preventing the introduction of disease into our State and the necessity of controlling and eradicating disease within the State of Montana that our herds are comparatively free from disease. If legislative action had not supported the Livestock Sanitary Board, Montana would not be in the enviable position it is now with regard to the healthiness of her livestock, and if disease had been permitted to get a good foothold in our herds it would have required enormous sums of money to eradicate it from these herds. Brief mention may be made of some of the diseases eradicated from our State.

Foot and mouth disease, which if it had ever gained a foothold in our State when it was shipped within our borders from a central livestock market, would not only have wrecked the livestock industry but would have destroyed the foundation of many of our financial institutions. This disease was eradicated within a few months after its introduction into the State.

A few years ago 18 counties in the State of Montana were quarantined by the Federal Government on account of cattle scabies. These quarantines all have been released and at the present time not one single case of cattle scabies is known to exist in the State of Montana.

Sheep scabies, a menace to the sheep industry, has not existed within the State of Montana for the past 13 years. Thirteen years ago a shipment of scabby sheep was imported into the State. Fortunately, by reason of legislative action, imported sheep were required to be quarantined. This shipment of sheep was quarantined, the disease discovered and eradicated without it ever exposing or affecting one of our native animals. To keep sheep scab out of Montana has required constant vigilance. It has required the establishment of line camps; stationing of line riders at vantage points and the sleeping out of range riders in sub-zero weather to prevent the surreptitious trailing of exposed and diseased sheep across the Montana State line.

Some years ago the Federal Government and sister States contemplated quarantining the entire State of Montana on account of Dourine in horses. Such an action would have been disastrous to our horse industry and many of our financial institutions, as this quarantine action was contemplated just previous to the sale of our horses for war purposes. This quarantine was averted by reason of the reputation of the Livestock Sanitary Board for efficient and decisive action in controlling livestock disease. Dourine was eradicated from our horses and today not one single case of dourine is known to exist in Montana.

Glanders, which is considered an incurable disease, and which is dangerous not only to horses but also to man, and which for a few

years existed to an alarming extent, has also been eradicated from the State of Montana. Not one single case of glanders is known to exist in the State of Montana at the present time.

Rabies, the most disastrous and appalling of all diseases and which may infect all warm blooded animals and human beings, has likewise been eradicated from the State of Montana.

Anthrax, another disease that attacks all warm blooded animals, including man, and which is very fatal, has not been known to exist in the State of Montana for the past three years.

Tuberculosis, which at one time existed in our dairy herds to an alarming extent, has been reduced to fourteen one-hundredths of one per cent. Just a few years ago in one district in Montana, upwards of 40 per cent of our dairy cattle were affected with tuberculosis. Not one single case of glandular bovine tuberculosis has existed in that district for the past three years. If the Montana Livestock Sanitary Board had not done one thing other than to eradicate tuberculosis in that district and to reduce the incidence of bovine tuberculosis in the State of Montana to fourteen one hundredths of one per cent, then it would have been justified in spending every penny it has ever spent. The work of the Livestock Sanitary Board has probably prevented the spread of tuberculosis in children and the incidence of human tuberculosis in Montana as much as any other one agency.

Dr. Charles Mayo has made the statement that twenty-five per cent of all tuberculosis in children and five per cent of tuberculosis found in adult humans may be directly attributed to bovine (cattle) infection.

The American Journal of Public Health and the Nation's Health of August, 1932, in an editorial has the following to say:

"* * * Following closely on this in America, comes the report of the Committee on Prevention and Research of the International Society for Crippled Children showing that ten to fifteen percent of cases of bone and joint tuberculosis are of bovine origin; that of children who suffer from tuberculosis, from 0 to 5 years, twenty-one percent, and five to sixteen years, twenty-six percent are infected by the bovine germ. The knowledge of these facts has not yet spread through the country. Most of those who have received this knowledge has been, to put it mildly astonished. Translating these figures into deaths and cases, it means that 3,500 to 4,000 children die annually in this country from bovine tuberculosis, and that at least eight thousand cases occur. * * * The public owes a debt of gratitude to our Bureau of Animal Industry and to state and city officials in their efforts to suppress bovine tuberculosis."

The Montana Livestock Sanitary Board may be likened to a fire department. The veterinarians of the Livestock Sanitary Board may make many investigations which prove to be unnecessary but if they fail to make one necessary investigation of a serious disease then the results may be as disastrous as a forest fire that gets away during a high wind in a dry season. It may be good economy for this Department to use quick methods of transportation or to send two or more special investigators to investigate disease. It may be necessary for the Board to use means that appear on the surface to be expensive. It is the end that justifies the means. It is the policy and it is the function of the Livestock Sanitary Board to prevent disease rather than to allow it to start and then attempt to control or eradicate it.

FINANCES

The livestock industry of Montana taxes itself by a special tax for the support of the Livestock Sanitary Board and for the payment of animals ordered destroyed by the Livestock Sanitary Board. In the case of tuberculosis in dairy cattle, the destruction of diseased animals is as much a public health protection as it is a protection to the livestock or dairy industry, and yet the State itself does not pay one cent for this protection. There is no question but that the work of the Board in controlling bovine tuberculosis has prevented thousands of children from contracting tuberculosis.

For many years, even before the State passed a budget act requirement, the Livestock Sanitary Board required a budget. The office force, the Laboratory, the Executive Officer and the Field Veterinarians and Inspectors were all placed on a strict budget and that budget may not be exceeded in any one month or year, except on the specific authority of the Executive Officer; and it is to be remembered that all acts or orders of the Executive Officer have to be approved or disapproved by the Board at its first subsequent meeting.

All salaried field employees are required to submit a weekly report, giving in detail their activities for each day in the week. They are required to report immediately the appearance of any serious or dangerous livestock disease.

There is some confusion in the minds of the public with reference to District and Resident Deputy State Veterinary Surgeons.

District deputies are salaried deputies in charge of Livestock Sanitary Board activities in a designated district. They operate on a strict budget.

Resident Deputy State Veterinary Surgeons are practising veterinarians. They do not receive a salary and may only incur State expense when specifically instructed to do so by the Executive Officer of the Board. They make many investigations as practising veterinarians and do much work for the benefit of the State without incurring State expense. Resident deputies likewise operate under the Board budget requirements.

During the last two years the receipts from the special tax on livestock has decreased approximately \$40,000.00. This is a decrease in tax money of approximately sixty-six and two-thirds per cent and twenty per cent in total monies appropriated to the Board for operations and payment of indemnity.

To meet this lessened income every employee of the Board, including resident deputies, has taken a reduction in salary or per diem of from ten to twenty per cent. It has also required the curtailment of field expenses and much necessary work.

The curtailment of disease control work, to say the least, may be unfortunate. If we have a serious outbreak of disease in our livestock and if livestock die, that is an economic loss and we generally survive economic losses even though painful. If these livestock diseases are transmissible to the human family that is another matter, far more serious than the loss of money.

The work of the Livestock Sanitary Board has prevented considerable disease in the human family. In milk work alone several outbreaks of scarlet fever and septic sore throat have been prevented or aborted. In addition to these diseases the work of the Livestock Sanitary Board has undoubtedly prevented the transmission of tuberculosis, diphtheria, typhoid fever, anthrax, rabies, glanders, blastomycosis, ringworm, taenia infestation, undulant fever and others of lesser importance to the human family.

In this connection we respectfully refer you to the Report of the Bacteriologist and Pathologist.

LEGISLATION

There has been no change requested in the law creating the Montana Livestock Sanitary Board as enacted in 1921. There is no request for a change or an amendment of any kind at this time.

This Montana statute has been cited many times in other states as an example of good legislation. The taxpayers of Montana have been saved considerable money by reason of there having been no changes requested or initiated since its enactment twelve years ago.

The Twenty-second Legislative Assembly added to the duties of the Livestock Sanitary Board and passed a separate act providing for the sanitary inspection of slaughter houses and the inspection and grading of meats intended for human consumption. This legislation is on a par with previous legislation relative to Livestock Sanitary Board activities. It is perhaps what may be termed "Legislation of the Future," in that money was not appropriated to put this act into operation and depressed conditions at the present time will undoubtedly prevent its operation for a few years to come. Nevertheless, it is good legislation.

Meat has proved to be one of the greatest of all body builders. Scientific investigation has proved that good healthy meat is one of the best, if not the best, source of protein. It is protein that builds the body

and repairs body waste. Carbohydrates, such as cereals and most vegetables, simply supply heat units. They do not make muscle or body tissues. It is protein that builds and repairs. Naturally a food product as valuable as meat, to be at its best, must be free from disease and of prime quality.

In the not far distant future all communities, cities and countries will require meat and meat food products to be properly inspected and graded to protect the public against diseased or inferior grades of meat and meat products. The Montana Legislature is to be congratulated in passing this progressive and advanced legislation.

LITIGATION

There has been no litigation connected with this Department during the past biennium. This makes the eighteenth consecutive year that the Livestock Sanitary Board has not been taken into the District Court or the legality of its regulations or the fairness of its orders questioned.

SCOPE OF WORK

This Department has found it necessary to include within its scope of work disease control in all classes of domestic animals and poultry, wild animals, wild game birds and fish, and the control and supervision of milk and cream production.

RESEARCH LABORATORY

The Research Laboratory located at Bozeman is operated under a cooperative agreement between the Montana Livestock Sanitary Board and the Montana Agricultural Experiment Station. It is doing excellent work for the stock interests of Montana. Several conditions peculiar to our western ranges have been cleared up which will result in considerable saving to our stock growers.

HORSES

There were no cases of Dourine or Glanders found in horses during the last biennium.

ENCEPHALOMYELITIS

Encephalomyelitis, a disease of horses that has entailed considerable loss in several of our sister states, does not exist in the State of Montana.

This is fortunate as there are embargoes against the movement of horses and hay from areas where this disease exists. The War Department is particularly careful and cautious in purchasing horses or hay in states where this disease exists.

This disease is caused by a filterable virus and may at times be confused with cerebro-spinal meningitis, botulism or the disease called forage poisoning.

DISTEMPER

We have had a few cases of distemper reported but in most cases the condition was readily amendable to treatment and prevention of spread was secured by isolation of infected animals and proper vaccination of exposed animals.

WORMS

In most sections of Montana worm infestation is quite prevalent in horses. In the western section of the State where we have swampy ground, infestation by the sclerostome worm will at times present itself as a minor problem. Sclerostome infestation is often mistaken for swamp fever or possibly spinal meningitis and is at times called mountain fever. With the proper treatment horses infested with this worm may make a complete recovery or at the very worst a decided improvement. The condition known as sclerostomiasis may be controled by proper treatment of horses once a year in sections where the sclerostome worm is very prevalent.

CATTLE

Tuberculosis

In cooperation with the United States Bureau of Animal Industry, in 1931, we tuberculin tested 142,853 cattle with a percentage of twenty-two one-hundredths of one percent reactors.

In 1932, in cooperation with the United States Bureau of Animal Industry, we tuberculin tested 82,649 cattle with fourteen one-hundredths of one percent reactors.

All that section of Montana lying west of the Rocky Mountain divide is a Modified Tuberculosis Free Accredited area. We have nineteen counties certified by the United States Bureau of Animal Industry and the Livestock Sanitary Board, cooperating, as Modified Tuberculosis Free Accredited areas. They are the following counties:

Beaverhead, Daniels, Deer Lodge, Flathead, Granite, Lake, Lincoln, Mineral, Missoula, Pondera, Ravalli, Richland, Roosevelt, Sanders, Sheridan, Silver Bow, Teton and Valley. Toole and Wibaux counties are in the process of accreditation and should be added to the Accredited area list in a few weeks.

We are in hopes that post mortem inspection of properly identified range cattle at abattoirs where Federal inspection is maintained will be accepted by the United States Bureau of Animal Industry as a means of adding range and semi-range cattle to accredited areas in lieu of the tuberculin testing of such cattle, as is now required.

JOHNE'S DISEASE

Two years ago Johne's disease, which is sometimes called "paratuberculosis," was discovered in an imported bull. This was the first time that Johne's disease had ever been reported in the State of Montana. While Johne's disease is also called "paratuberculosis," it is not tuberculosis in any form; neither is it associated with tuberculosis in any way.

It is a condition caused by an acid fast organism which in many respects resembles the organism causing tuberculosis but, as has been stated, it is not tuberculosis and is not to be confused with tuberculosis.

The condition affects the digestive tract resulting in an intermittent diarrhea, considerable emaciation and eventually death. It is a very slow developing disease. In experimental studies conducted at Cornell it is stated it took five years for the disease to develop. It is a disease that so far has not been amenable to any known treatment. However, Spicer regards the organism of Johne's disease a mere saprophyte of the digestive tract of cattle that only becomes pathogenic or disease producing when the animals affected have become enfeebled by the over-production of milk and lack of mineral salts in the ration. Spicer states that a calcium deficiency is the actual cause of Johne's disease and that the administration of bone meal, phosphate and carbonated lime are means of preventing it.

If these statements are correct, we will be able to prevent, if not actually cure, Johne's disease in a very practical and inexpensive manner.

SCABIES

Neither sarcoptic nor psoroptic mange of cattle is known to exist at this time in the State of Montana.

ANTHRAX

Anthrax has not been reported or observed in Montana for the last three years.

BANG'S DISEASE

Bang's disease is commonly referred to as infectious or contagious abortion.

In 1931 we blood tested 16,873 cattle for Bang's disease with 23 percent reactors.

In 1932 we blood tested 19,076 cattle for Bang's disease with 14 percent reactors.

We have done a great deal of work on this disease and we have carried on numerous experiments in an effort to cure Bang's disease. With repeated intravenous injections of acriflavine we have prevented actual abortions but we have not cured infected animals. An animal infected with this disease may appear perfectly healthy and carry her calf to maturity and give birth to a living, healthy calf, but at the same time she may be a spreader of the disease and infect susceptible animals.

In conjunction with the United States Bureau of Animal Industry we are carrying on experiments with a vaccine for the prevention of Bang's disease. So far these experiments may be classed only as hopeful as nothing is yet definite or positive in the way of a preventative.

This disease is of added importance as it may be transmitted to the human family. When it occurs in the human family it is called Undu-

land Fever. It is of particular importance that the virulent type of this disease, that is transmitted to the human family, be prevented from infecting our dairy cattle.

A pamphlet has been prepared on Bang's disease which will be forwarded to any interested stockman.

VESICULAR VAGINITIS

In practically every herd where we have found Bang's disease and where sterility was a problem we have found vesicular vaginitis. Fortunately this disease is amendable to treatment. In herds where vesicular vaginitis is the cause of sterility with a resultant poor calf crop, owners of such herds may be assured of a materially increased calf crop by following the outline of treatment recommended by the Livestock Sanitary Board.

It has been our observation that many stockgrowers do not give serious enough attention to sterility or non-breeders. They take it as a matter of course. By careful analysis of figures furnished us by certified public accountants we are led to the conclusion that on most ranches an 80 percent calf or lamb crop is the dividing line between profit and loss. The more the percentage is below 80 percent the greater the loss. The higher the percentage above 80 percent the greater the profit.

BLACKLEG

Blackleg made its appearance in quite a number of cattle in 1931, so much so it was necessary for us to register a complaint with the United States Bureau of Animal Industry with reference to the quality or potency of blackleg vaccine that was being sold. It was our findings that a number of blackleg vaccines apparently were not of sufficient strength or potency to properly immunize animals against the more virulent strains of the blackleg organism.

In sections where blackleg is particularly virulent we recommend that our stockmen vaccinate suckling calves and re-vaccinate these calves again after they have been weaned. Where animals are vaccinated after they are weaned, in badly infected districts, we recommend that a dose and a half or a double dose of vaccine be given.

We believe that the blackleg bacterin will prove even more potent and give a more lasting immunity than blackleg aggressin.

During the year 1932 blackleg has not been as prevalent as it was in 1931.

COCCIDIOSIS

This disease as usual makes its appearance during inclement weather and generally during the winter months. With a change of feed together with internal antiseptics, animals in most instances make a complete recovery. A pamphlet on this disease has been prepared by the Livestock Sanitary Board and will be mailed to any interested stockman.

HEMORRHAGIC SEPTICEMIA

Several cases of hemorrhagic septicemia have been reported during the last biennium but this disease is not of serious importance as yet to the stock industry of Montana. It is of serious importance to feeders as animals oftentimes contract this disease when shipped through public stockyards. We believe that by shipping direct from our range areas to the feed lots, without going through public stockyards and that with vaccination and proper handling of cattle en route that the incidence of this disease may be very materially reduced.

STRANGLES

A rather peculiar disease made its appearance in cattle during the fall of 1931. We had never seen this condition before and we knew of no one in this country who had ever seen it previous to 1931.

The disease, as it occurred in cattle, resembled strangles in horses in that abscesses would form on the body of the animal, generally in the abdomen just in front of the umbilicus. Our laboratory made many examinations and in all material forwarded pure cultures of a streptococcus were demonstrated. The disease was apparently not serious, the animals recovered even if given no treatment but it did cause loss of flesh. In our observations of this condition we came to the conclusion that the small horn or buffalo fly, which congregates on the abdomen of cattle, might be a carrier of this infection and spread it from one animal to the other.

It would appear also from our observations that this disease in some way is connected with drouth conditions. It occurred only in areas where we had a severe drouth.

There have been no cases of strangles in cattle observed or reported during the year 1932.

VENEREAL NECROBACILLOSIS

The venereal form of necrobacillosis was found to exist in three bulls in eastern Montana during the fall of 1932. This is the first time that this condition has ever been observed in cattle in Montana. When the trouble made its appearance it was rather alarming to the stockgrowers in the district where the disease occurred. Fortunately, however, this trouble is amenable to treatment and was confined to three bulls.

BLASTOMYCOSIS

Blastomycosis in a boy was reported to this Department by Dr. Thomas L. Hawkins, Physician and Surgeon at Helena. Upon investigation we found that this boy lived on a farm adjacent to Helena. Examination of the cattle on this farm disclosed a calf, that the boy had been handling, affected with blastomycosis. There is no question but that the disease was transmitted from the calf to the boy. Blastomycosis,

which resembles ringworm to some extent, is, to say the least, disagreeable and is quite resistant to treatment.

The infection in the boy was cleared up. The infection in the animal was cleared up by treatment with tincture of iodine.

LUNG WORMS IN CATTLE

In western Montana lung worms (*dictyocaulus viviporus*) were found infesting the lungs of calves. The calf pasture on this particular ranch was on bottom lands where there was a slow-running creek which was continually being dammed up by beaver, resulting in the flooding of the meadows. We are of the opinion that deer infested with lung worms caused the original infestation of this pasture. Authorities state that lung worms in deer may be transmitted to cattle. In this particular section it is reported that deer are infested with lung worms, although this is merely hearsay evidence from hunters and has not been proved by this Department. The owner was advised to keep calves and cattle away from this pasture and not to use it unless its use became absolutely necessary in winter months. While this may not eradicate lung worms infestation on this particular ranch, we believe it will very materially reduce the losses.

MEASLES

(*Cysticercus Bovis*)

The so-called measles in cattle is caused by the larval stage of the human tape worm, the *Taenia Saginata*. Measles cannot be transmitted from cattle to other cattle but if a human being eats of a portion of meat containing these living larva then that human being will become infested with the tape worm, *Taenia Saginata*. The only way that cattle may become infested with these larva is to pick up tape worm segments dropped by a human being.

There have been a number of cases of measles found in cattle fed on beet tops and in beet fields. Investigations disclosed that in many cases beet workers infested with the *Taenia Saginata* which is not at all uncommon, use beet fields and adjacent shrubbery as a toilet. Cattle grazing over these areas naturally become infested.

The cycle starts with the human being, is transmitted to cattle and back again to the human family.

The Montana State Board of Health and County and City Physicians cooperated with the Livestock Sanitary Board in preventing further infestation with this parasite. The State Board of Health gave very material assistance and placed a special investigator in the incriminated area. Meetings were held, beet growers were interviewed and the condition explained to them. Movable field toilets were provided and other sanitary procedures outlined and followed so that it is our expectation that *cysticercus bovis* infestation will be very materially reduced if not eradicated in the lately infested areas.

MALIGNANT EDEMA

This disease is not to be confused with blackleg, though it has sometimes been confused with blackleg. Like blackleg it must have a definite port of entry, that is a wound or an abrasion of some kind. Ordinarily it only occurs in sporadic or isolated cases but when animals are congregated on contaminated areas quite a number of animals may become infected. This happened during the year 1932 in a herd of cows, at calving time. These cows were calving on an old bed ground in a creek bottom where there were a number of eaten-off willow sprouts and a quantity of short, sharp brush. It is our opinion that this damp, dirty bed ground became infected and that in calving, probably severe laceration of the genital tract resulted from the cows lying in the brush along the creek which provided a port of entry for this infection.

No further loss was incurred when the cows were removed from the infected bed ground.

This is called to your attention to point out how essential it is that all animals at calving or lambing time be provided with clean uncontaminated bed grounds or sheds.

ULCERATIVE STOMATITIS

This disease is characterized by a degeneration and sloughing of the mucous membrane or lining of the mouth. In some instances this sloughing condition may extend further down the digestive tract. It may be confused with foot and mouth disease.

In one section of central Montana ulcerative stomatitis caused considerable individual loss. The farm on which this condition occurred was particularly dirty, rendering the cure of the disease rather difficult.

The effective method of handling this disease and preventing its spread requires strict isolation of the infected animals and a thorough cleaning and disinfecting of the contaminated premises.

This disease is called to your attention on account of the possibility of its being confused, in its inception, with foot and mouth disease.

URINARY CALCULI

This is not an infectious or contagious disease. It is simply a mechanical condition where lime deposits get lodged in the urethra of male animals and prevent the elimination of urine. It is sometimes called "water belly." The urine gets dammed up in the bladder; the bladder ruptures; the urine escapes into the abdominal cavity; hence the name "water belly." Unless the mechanical stoppage is relieved by severing the urethra or the lime deposits removed the result is invariably death to the animal.

Observations have led us to believe that drouth conditions are a decided factor in the incidence of this disease. We are of the opinion that it is not so much a question of concentrated lime salts in the water supply as it is a lack of certain vitamins or other complex chemical

substances in the food supply that inhibit the proper assimilation of calcium. It is also quite possible that mouldy food, improper castration or other conditions that favor or produce local foci of infection play an important part in the formation of urinary calculi.

Many cases of this trouble were reported in 1931 from all sections of Montana. A considerable number of these cases were relieved by proper surgical treatment.

There have been no cases of urinary calculi reported during the summer or fall of 1932.

A leaflet with drawings illustrating this condition has been prepared and will be forwarded to interested stockmen.

SHEEP

Scab

Sheep scab does not exist in the State of Montana and has not existed in our native sheep for the last 16 years.

LIP AND LEG ULCERATION

Lip and leg ulceration, which is a form of necrobacillosis and which at one time was rather prevalent, for the past biennium has been conspicuous by its absence, only one or two cases being reported to this Department.

FOOT ROT

Foot rot, which is also considered a form of necrobacillosis, has been much less prevalent during the past biennium than during the previous biennium. We attribute this to proper treatment and our sheepmen taking necessary precautions against the occurrence of this malady.

The Veterinary Research Laboratory at Bozeman has published a very timely pamphlet on foot rot and its treatment, which will be forwarded to interested stockmen.

LAMB DYSENTERY

Weather conditions have been so favorable during the past biennium that there has been practically no lamb dysentery in the State. The Veterinary Research Laboratory staff at Bozeman have done considerable work on this disease and have proved conclusively that it is not the same disease that is present in England and for which the English people have developed a vaccine. Apparently the disease is influenced by inclement weather more than by anything else. The secret of prevention is to have our lambs born under conditions where they can be taken care of, kept warm and not subjected to inclement weather. If our sheep growers desire to lamb out early then they must provide not only clean lambing sheds but they must provide proper facilities within these lambing sheds for keeping young lambs warm and dry in order to prevent the occurrence of lamb dysentery. This type of dysentery has not been observed in May lambs born under range conditions.

STIFF LAMBS

This condition has been reported previously and we will only reiterate that there are two conditions which cause stiff lambs. One is improper calcium assimilation and the other is a bacterial infection that gets into the lambs system at the time of birth or at the time of docking or castration.

Dr. Hadleigh Marsh, of the Veterinary Research Laboratory, has lately demonstrated that the organism which causes swine erysipelas is also a causative agent of arthritis in lambs.

Every precaution should be taken by sheepmen to prevent the introduction of infection through the navel cord at time of birth or through the castration or docking wound at the time of such operations.

Immediately after the lamb is born its entire navel cord should be immersed in iodine or an effective disinfectant. The navel cord should not simply be swabbed with the disinfectant but entirely immersed in the liquid.

When lambs are castrated they should never be thrown back into a dusty or muddy corral but should be thrown out or turned loose immediately on grassy, well-sodded, uncontaminated areas.

The same procedure should also be followed when a lamb is docked. We believe that a hot iron pincher, heated to a cherry red is the most practical method for preventing the introduction of infection at the time of docking.

BLACK'S DISEASE

A condition in sheep which resembles blackleg has been found to exist in several small farm flocks in the Bitter Root Valley and which we believe is identical to Black's disease, as reported by Turner of Australia. For a more detailed report of this disease we refer you to the report of the Bacteriologic and Pathologic Laboratory.

WORMS

We had considerable tape worm infestation of our sheep during the spring of 1932. The tape worm in practically all instances proved to be the *moniezia expansa*. Fortunately this condition is amenable to treatment. We have had apparent success with the copper sulphate-nicotine solution in the same proportion that we use for stomach worms. That treatment is:

Copper Sulphate	.....	1½ ounces
Blackleaf 40	.....	1 ounce
Water	.....	1 gallon

Sig: Four ounces to a grown sheep, two ounces to a lamb. The animals treated are to be kept off feed for from twelve to twenty-four hours before receiving the medicine and in twenty-four to forty-eight hours after receiving the medicine they are to be moved to fresh pastures.

Apparently water conditions have had considerable to do with the spread of this tape worm. It is advisable for sheepmen to keep their sheep away from stagnant waters or pot-holes and practice tepee herding where it is possible to do so. It is realized that where water is scarce tepee herding offers many difficulties but if we continue to herd sheep over the same ground, bed them down night after night on the same bed grounds and hold them around the same water holes day after day, if one animal is infested with a parasite of any kind it is almost a certainty that a great majority of the sheep in that band will become infested or infected with the parasite.

It is a well-known fact that animals may not graze over their own excreta or the droppings of other animals without incurring considerable risk of developing disease.

We realize that reservoirs are necessary for the conservation of surface water but nevertheless reservoirs and stagnant pot-holes make ideal nests of infection and are ideal places for the spread of livestock disease.

We recommend that our stockmen, wherever possible, develop a subterranean water supply for their livestock. The geographic structure of Montana indicates many subterranean sources of artesian water. Artesian water for our livestock will save thousands of dollars in the animals winter food consumption and will very materially aid in conserving flesh during the winter months and put the animal in a better condition to put on flesh during the summer grazing season.

LIVER FLUKES

Liver fluke disease is caused by a flat oval, leaf-shaped fluke-like worm (*Fasciola hepatica*). This parasite may infest any ruminant, that is any animal that chews its cud. It may also occasionally infest other animals, including man. Sheep, however, are the principal sufferer. Closely following sheep come goats, deer, elk and cattle.

The life cycle of this parasite is particularly interesting. The adult fluke is found in the bile ducts and liver substance of the affected animal. It may produce one hundred thousand eggs. These eggs get into the intestines along with the bile and pass into the outer world with the droppings of the animal. Eggs which reach water, hatch: those which remain on dry land do not hatch. Eggs which reach water hatch in about 11 days liberating an embryo fluke called the miracidium. These miracidium swim around in the water until they reach a right-handed snail. They do not attack or penetrate into a left-handed snail. By right-handed snail we mean a snail whose opening is to the observers right, when the peak or point of the snail is held upper-most. Why these miracidium do not attack or penetrate into a left-handed snail is a phenomenon that no one as yet has explained. Two stages of the fluke develop within the snail. The time for this development may be anywhere from 50 to 80 days. When the final development of this stage has taken place the immature fluke is then called the cercariae. For every miracidium that penetrates into the snail body anywhere from 15

to 100 cercariae may emerge. These cercariae are tad-pole like in shape. They wiggle about in the water, lose their tail, excrete a sticky substance in which they encyst themselves. They may attach themselves by means of this sticky substance to grass, or they may float around on the surface of the water. Susceptible animals, when they eat grass with these encysted cercariae on it or drink water which contains these encysted cercariae, become infested with the liver fluke. When these encysted cercariae are taken into the stomach the cysts are absorbed and the young flukes liberated. These young flukes then bore through the walls of the intestines of the animal, get into the body cavity and in about 14 days reach the liver. When they reach the liver they penetrate the liver capsule, finally ending up in the bile ducts where they grow to sexual maturity and the whole cycle starts over again. The time required for the completion of the life cycle from egg to egg is from six to eight months.

This condition causes a rather severe loss in sheep in infested areas. In cooperation with the Zoological Division of the United States Bureau of Animal Industry we have located most of these infested areas in Montana and at a later date contemplate a concerted drive to rid these infested areas of right-handed snails by means of copper sulphate treatment. If there are no right-handed snails in which the miracidium may develop then we will have no flukes. Individual sheep are treated with carbon tetrachloride with very favorable results. The individual treatment of cattle with carbon tetrachloride is dangerous and is not recommended.

One of the interesting findings is that we have never observed this condition in animals in the eastern range section of Montana. It is practically without exception confined to the districts west of the Rocky Mountain divide.

This parasite is of economic importance, not only to stockgrowers, but also to wild animal life, as in some sections deer and elk become very badly infested, causing a condition which is known to hunters as "rotten livers."

LUNGERS

We are sorry to report that nothing new has been determined on this disease. It appears to remain about stationary in its occurrence. We are quite positive that there has been no great spread of disease during the past two years but it takes its toll from our sheep flocks every year. The United States Bureau of Animal Industry is still working on this disease, as is our Veterinary Research Laboratory, and we hope that eventually something definite will be developed to aid us in preventing this benign, slow but rather fatal infection.

BIG HEAD

The Department veterinarians have investigated several outbreaks of big head. This condition is apparently not of an infectious or contagious nature. We believe it is due to the animal becoming sensitized to some particular plant or substance and that this sensitization is

brought out or manifests itself when the animal is subjected to adverse weather conditions or excessive sunlight. In big head a number of animals become affected within a few hours of each other.

There is also a condition that resembles big head but which is more sporadic in nature that is not due to a sensitization but is caused apparently by some micro-organisms, probably a filterable virus.

The best treatment for big head is to get the affected animal into protected shade and let it absolutely alone. Bland emollients or lard may be applied to the head but under no condition should the affected animals be driven hurriedly to shelter. Some recommend scarifying or cutting the affected areas and letting the fluid escape but such a procedure is questionable. We prefer getting the animals into shelter and shade and then letting them absolutely alone.

URINARY CALCULI

We seldom observe urinary calculi in sheep. Early in 1931, however, one feeder of lambs suffered rather a heavy loss from this trouble. The condition is similar to that described as urinary calculi in cattle. These affected lambs had been fed mouldy corn. There is no medicinal treatment that will correct this condition once it develops. The remaining lambs in the band were taken off the mouldy corn feed and no new cases developed. It has been demonstrated that mouldy corn may cause a similar condition in hogs.

MEASLES IN SHEEP (*Cysticercus Tenuicollis*)

The post mortem appearance of sheep measles is somewhat similar to measles in cattle, only infestation is usually found in the peritoneum, pleura and liver. The main difference is that measles in sheep is due to the larval stage of the *Taenia Hydatigena*, a tape worm of the dog and possibly coyote and wolf.

There have been several cases of measles in sheep reported. In each instance the dogs on the sheep ranch were wormed out and it is hoped no further infestation of sheep will occur.

SWINE Hog Cholera

Hog cholera occasionally occurs in Montana but not to the extent it does in most of our sister states.

During the year 1931 hog cholera was found to exist on 13 premises.

During the year 1932 hog cholera was found to exist on nine premises.

Again we appeal to our hog growers to avoid the feeding of unsterilized garbage. While hog cholera is not at this time prevalent in Montana, nevertheless if we feed hog-cholera-infected garbage the disease will make its appearance on more and more farms. It is also not unreasonable to presume that as the incidence of the disease increases the virulency of the disease will also increase. If the virulency and the

incidence of the disease increases it will not be many years before we will be confronted with the same problem in controlling hog cholera as the hog growers of the middle west now face. If proper vigilance is exercised and hog growers and hog feeders will follow the recommendations of the Livestock Sanitary Board, the disease, hog cholera, will never become a menace to the hog growing industry of this State.

WORMS

Hogs are quite susceptible to worm infestation and more hogs are lost in Montana from worm infestation than from hog cholera. We recommend to all swine growers that they handle their hogs in accordance with the McLean County System and that they use every precaution to prevent worm infestation.

MEASLES IN SWINE

Fortunately only one case of measles in swine has ever been reported in Montana. This condition is due to the larval stage of the *Taenia Solium*, a tape worm of man. The cycle is similar to that described under measles in cattle. The one case in question of swine measles occurred several years ago. It was discovered on a farm where an employee, a recent arrival from southern Europe, was found infested with the *Taenia Solium*. We say fortunate, because *T. solium* infestation is rather serious. Infestation with the *T. saginata* (from cattle measles) is annoying and inconvenient, but it is not considered serious.

WILD ANIMALS AND FISH

This department has done considerable work in the investigation of disease in wild animals and fish and also in fur-bearing animals which will be readily recognized by reviewing the report of the Bacteriologic and Pathologic Laboratory.

DOGS

Rabies has not existed in the State of Montana during the last biennium.

POULTRY

The amount of work done for the poultry industry best may be realized by a review of the Bacteriologic and Pathologic Laboratory report and also a review of the tabulated report of work done by this Department.

In 1931 we examined 186,552 fowls.

In 1932 we examined 73,162 fowls.

For a further report on Poultry we refer you to the report of the Pathologist and Bacteriologist.

DAIRY INSPECTION

Dairy inspection continues to be one of the main projects of this Department. Dairy inspection is not spectacular work but it is a very important work, although routine in its nature. Through proper dairy inspection, together with laboratory examination of milk, many outbreaks of disease in children are prevented or aborted in their inception.

For the guidance of the various municipalities in the State of Montana a uniform milk ordinance has been drawn up by the Livestock Sanitary Board which has the approval of the United States Public Health Service and the Montana State Board of Health.

The milk supply of Montana is particularly good, better than the milk supply of most communities, states or countries. This has been accomplished through the cooperation of our milk producers with the Livestock Sanitary Board in the production of a safe, wholesome milk supply.

Unfortunate financial conditions which exist at the present time undoubtedly have been an incentive for owners of a few cattle to bootleg milk. They have surreptitiously sold milk in various communities; they have cut prices as they only intend to be in the milk business for a few months, discontinuing when the winter season comes on and milk production becomes more expensive. A situation of this kind is indeed unfortunate, both to the public as well as to the milk producers who comply with the law, take out a license, improve their dairy and pay substantial taxes. Cheap milk sometimes, in the long run, is the most expensive. It is not a safe procedure for anyone to shop around for cheap milk any more than they would shop around for a cheap surgical operation.

We realize very forcibly the unfortunate financial condition that exists and we know that on a number of our small farms the only immediate financial return is through the sale of milk and cream. We realize, also, however, that all milk and cream that is to be consumed in its raw state should be produced only in the most cleanly and sanitary manner and milk that is not safe-guarded against the introduction of infection should not be permitted to be sold as such for public consumption. Milk is the most ideal of all foods but is unfortunately one of the most easily contaminated of foods. If candy were made in as dirty a place as some of these small farm dairies, there are very few of us that would eat candy, and yet candy is not nearly as susceptible to infection or contamination as milk.

The milk producer that is complying with the laws and regulations, who endeavors in every possible way to produce a clean, safe product, and who is continually adding to his equipment and whose taxes increase with every addition to his equipment, is entitled to adequate protection as is the consumer of milk. An adequate system of milk inspection cannot be state-wide in its scope. The unincorporated town cannot enforce and should not be required to enforce regulations which should be required in larger communities. The protection of the milk consumer and milk producer must necessarily rest with the individual municipalities in cooperation with the State.

In 1931 the Livestock Sanitary Board issued 955 dairy licenses.

In 1932 the Livestock Sanitary Board issued 887 dairy licenses.

MILK PLANTS

In 1931 the Livestock Sanitary Board issued 34 milk plant licenses.

In 1932 the Livestock Sanitary Board issued 28 milk plant licenses.

SLAUGHTER HOUSES

In 1931 the Livestock Sanitary Board issued 85 slaughter house licenses.

In 1932 the Livestock Sanitary Board issued 74 slaughter house licenses.

It may not be amiss to call the attention of our Legislature to the fact that never has the Livestock Sanitary Board received any special appropriation from the General Fund for dairy inspection or for the work of controlling the sanitary production of milk and milk products.

Neither has the Legislature ever appropriated money to the Livestock Sanitary Board for the inspection of poultry or the prevention of disease in poultry.

Also, it might be well to call the attention of the Legislature to the fact that none of the fees collected for dairy, milk plant or slaughter house licenses accrue to the benefit of this Department but are turned into the General Fund. We believe that the Legislature in all fairness, inasmuch as they never appropriated money for this additional work delegated to the Livestock Sanitary Board, should provide for these license fees to accrue to the Livestock Sanitary Board.

BACTERIOLOGIC AND PATHOLOGIC LABORATORY

We desire to call to your special attention to the excellent work performed by the Bacteriologic and Pathologic Laboratory and to the increased amount of work that the laboratory staff has performed.

We do respectfully request that you read over very carefully this report. It is not only instructive but you will find it decidedly interesting and will be amazed at the scope of work that the laboratory staff is called upon to perform.

CHEMICAL LABORATORY

We also desire to call your attention to the excellent work of the Chemical Laboratory and request that you read the chemical laboratory report over very carefully as you will find it instructive and interesting.

STOCKGROWERS

The stockgrowers of Montana have placed confidence in the Livestock Sanitary Board and its veterinarians and inspectors. It is this confidence and the excellent cooperation stockmen have given to the Livestock Sanitary Board corps that has made their work successful and agreeable. Without such confidence and cooperation livestock disease control work would not be successful.

COOPERATION

The work of the Livestock Sanitary Board is highly specialized. Its work is not duplicated nor overlapped by any other State Department. We are indeed fortunate, however, in receiving much helpful cooperation, not only from the stockgrowers themselves, but also from State Departments and Institutions.

We appreciate and thank the State Board of Health, County, City and practicing physicians, City Milk Inspectors, the Animal Husbandry Department at Bozeman, the State Experiment Station and the County Agents for the splendid cooperation they have given the Montana Livestock Sanitary Board.

UNITED STATES BUREAU OF ANIMAL INDUSTRY

Again we desire to record our appreciation of the work of Dr. J. W. Murdoch, Federal Veterinarian in charge of the United States Bureau of Animal Industry activities in Montana, and to his excellent corps of veterinarians.

Dr. Murdoch has made the cooperative work of the United States Bureau of Animal Industry and the Montana Livestock Sanitary Board particularly agreeable and effective. He and his Veterinary corps have rendered splendid service and are to be particularly complimented for their handling of cattle scabbies on the Crow Indian Reservation and adjacent lands and for the excellent program of area work in Montana.

LIVESTOCK SANITARY BOARD CORPS

There are not many veterinarians in Montana but what the veterinarians lack in number they make up in quality. I know of no state in the Union that has a better, more efficient or more loyal corps of field veterinarians than the State of Montana and the Livestock Sanitary Board.

APPENDED REPORTS

There is attached to this report the report of the Bacteriologic and Pathologic Laboratory. Also the report of the Chemist to the Livestock Sanitary Board.

There is also appended a summarized report of the work accomplished by this Department in conjunction with the United States Bureau of Animal Industry for the past biennium. Also a report of livestock importations for 1931 and 1932.

We respectfully call your attention to the amount of work performed by this Department. During the biennium 1931 and 1932 we inspected 4,142,098 animals, 259,714 poultry and made 23,124 meat inspections or a total of 4,424,936 inspections. To do this it was necessary for the deputies of the Livestock Sanitary Board to travel 357,299 miles.

It is to be remembered that there are no county veterinarians or city veterinarians in the State of Montana. All inspections made for the control and eradication of infectious-contagious diseases of livestock and poultry are made by members of the Livestock Sanitary Board corps.

(Signed) W. J. BUTLER,

Executive Officer,

Montana Livestock Sanitary Board.

Report of the Pathological and Bacteriological Laboratory

December 1, 1930 to November 30, 1932

During the years 1931 and 1932, 47,793 specimens have been examined in this laboratory. The material consisted of blood, serum, tissues, skin scrapings, pus exudates, feces, parasites, meat, milk, water, ice cream, feeds, plants, and milk containers for sterility. The species of animals represented in these specimens are cattle, horses, sheep, swine, chickens, turkeys, geese, ducks, pheasants, blue grouse, dogs, foxes, mink, antelope, elk, deer, porcupine, fish, squirrels, cats, rabbits, badgers, prairie chickens, canary and man.

The rather marked increase in the number of specimens as compared to the biennial report of the previous two years, which showed 6,760 specimens examined, is in the main due to the increased number of agglutination tests conducted for Bang's disease and to the increased number of milk samples which were examined in this laboratory.

The following is a classified list of the examinations made, giving the number of positive and negative diagnoses for each condition:

Report of the Pathological and Bacteriological Laboratory

	Positive	Negative
Abortion, cattle	6,602	29,347
Abortus Infection, human	2	3
Abortion, goat	0	1
Abortion, swine	3	2
Abortus B., isolation tissues	1	7
Abscess, cattle	4	0
Abscess, spinal, cattle	1	0
Abscess, rabbit	4	0
Abscess, horse	1	0
Abscess, Streptococcic, cattle	4	0
Abscess, Streptococcic, liver, cattle	1	0
Abscess, mink	2	0
Abscess, Internal, deer	2	0
Actinomycosis	12	4
Anaplasmosis	2	1
Anthrax, cattle	0	17
Anthrax, human	0	2
Air Sac Mites, Avian	1	0
Amaurosis, Avian	1	0
Arthritis, lambs	2	0
Ascarid Larvae, liver, cattle	1	0
Bacillary White Diarrhea, avian	36	16

	Positive	Negative
Bacillary White Diarrhea, turkeys	0	9
Blackleg, cattle	31	13
Blackleg, sheep	1	3
Botulism	1	3
Blackhead, turkeys	5	0
Bighead, sheep	1	0
Brooder Pneumonia, chickens	1	0
Black's Disease, sheep	6	0
Black's Disease, cattle	0	1
Blastomycosis, cattle	1	0
Beef Measles	1	0
Bumble Foot, canary	1	0
Cholera, swine	7	3
Cholera, turkeys	5	0
Cholera, chickens.....	4	0
Carcinoma, dog	1	0
Carditis, chicken	1	0
Coccidiosis, cattle	11	3
Coccidiosis, sheep	1	1
Coccidiosis, dog	2	0
Coccidiosis, turkey	1	0
Coccidiosis, rabbit	6	1
Coccidiosis, chickens	12	1
Distemper, dog	1	0
Distemper, cat	1	0
Dermatitis, swine	1	0
Enteritis, chickens	4	2
Enteritis, Necrotic, swine	2	1
Enteritis, prairie chickens	1	0
Enteritis, Infectious, cat	2	0
Emaciation, chickens	3	0
Emphysema, turkey	1	0
Fatty Degeneration, liver, chickens	2	0
Fatty Degeneration, liver, swine	2	0
Fibroma, cattle	2	0
Fibroma, liver, chicken	1	0
Fibroma, sheep	1	0
Flukes, cattle	11	0
Flukes, deer	0	1
Flukes, sheep	2	0
Gout, avian	1	0
Hemorrhagic Septicemia, cattle	6	13
Hemorrhagic Septicemia, sheep	6	4
Hemorrhagic Septicemia, swine	0	1
Hepatitis, swine	1	0
Hepatic Degeneration, chickens	1	0
Helio Dermatitis, cattle	2	0
Hepatitis, Mallard duck	1	0

	Positive	Negative
Hemoglobinuria, cattle	1	0
Human Throat Culture	1	0
Inflammation Oviduct, chickens	2	0
Infectious Bronchitis, avian	9	1
Johne's Disease	8	0
Keratitis, Infectious, cattle	1	0
Leukemia, chickens	14	3
Lung Worms, cattle	2	0
Laryngotracheitis, chickens	4	0
Laryngotracheitis, turkeys	1	0
Laryngitis, human	1	0
Malignant Edema, cattle	3	1
Malignant Edema, sheep	1	0
Mastitis, cattle	1	0
Meningitis, horse	3	0
Mineral Disorders, avian	1	0
Malnutrition, sheep	2	0
Malnutrition, cattle	1	0
Metritis, cattle	1	0
Melanosis, swine	1	0
Malnutrition, canary	1	0
Mange, Follicular, dog	1	0
Nephritis, sheep	2	0
Neoplasm, liver, cattle	3	2
Nephritis, cattle	1	0
Neoplasm, chickens	2	0
Necrobacillosis, cattle	<u>22</u>	4
Necrobacillosis, hogs	5	0
Necrobacillosis, sheep	5	0
Necrobacillosis, liver, cattle	2	0
Navel Infection, sheep	1	0
Nicotine Poisoning, cattle	1	0
Osteoma, canary	1	0
Pericarditis, chickens	2	0
Pericarditis, Traumatic, cattle	1	0
Pox, fowl	2	0
Pox, cattle	1	0
Peritonitis, chickens	11	0
Peritonitis, Turkey	4	0
Pneumonia, chickens	17	0
Pneumonia, cattle	4	0
Peritonitis, snow goose	1	0
Paralysis, general, mallard duck	1	0
Paralysis, range, chickens	5	0
Pyometra, swine,	3	0
Peritonitis, antelope	1	0
Pneumonia, sheep	2	0
Paralysis, cattle	1	0

	Positive	Negative
Proventriculitis, ulcerative, chickens	1	0
Parasites, external, deer	1	0
Parasites, external, chickens	4	0
Parasites, external, dog	2	0
Parasites, external, cattle	2	0
Parasites, external, rabbit	1	0
Parasites, external, hog	1	0
Parasites, intestinal, dog	15	5
Parasites, intestinal, horse	1	0
Parasites, intestinal, sheep	13	0
Parasites, intestinal, hogs	2	0
Parasites, intestinal, chickens	46	2
Parasites, intestinal, cats	2	1
Parasites, intestinal, duck	2	0
Parasites, intestinal, turkeys	2	0
Poisoning, water hemlock, cattle	2	0
Poisoning, salmon, cat	1	0
Poisoning, strychnine, dog	2	0
Plant poisoning, sheep	2	0
Rabies, dog	0	2
Roup, diphtheritic, chickens	5	1
Roup, diphtheritic, turkeys	1	0
Roup, nutritional, chickens	1	0
Roup, ocular, chickens	2	0
Ring Worm, cattle	2	2
Ring Worm, dog	1	0
Ruptured liver, chickens	1	0
Scab, sarcoptic, cattle	17	49
Scab, cattle	0	56
Scab, sheep	0	4
Scab, horses	0	4
Sarcoma, chickens	1	0
Sarcoma, cattle	4	0
Snuffles, rabbit	2	0
Strangles, cattle	1	0
Sweet Clover poisoning	2	0
Tuberculosis, chickens	15	3
Tuberculosis, turkeys	6	2
Tuberculosis, cattle	10	6
Tuberculosis, swine	1	4
Tetanus, cattle	1	0
Torticollis, rabbit	1	0
Urinary Calculi, sheep	4	0
Urinary Calculi, cattle	2	0
Ulcerative Stomatitis, cattle	1	0
Miscellaneous Specimens	0	29
No diagnosis	0	19
Sub-Total	7,181	29,660

	Positive	Negative
Milk for Bacterial Count	1,956	0
Milk for Streptococcic Determination	1,149	3,724
Milk for B. Coli Determination	492	1,365
Milk for Abortus Agglutinins	273	1,299
Milk for Bacillus Abortus Examination	0	2
Milk for Tuberculosis Examination	0	1
Milk of Goat for Bacterial Examination	1	0
Milk for Anthrax Examination	1	0
Meat for Food	9	6
Water for Bacterial Count	71	0
Water for B. Coli Determination	25	63
Water for Streptococcic Determination	3	14
Containers for Sterility	27	0
Blood Samples Hemolyzed ..	310	0
Blood Identification	3	0
Feed Examination	6	0
Cream for Bacterial Count	42	0
Cream for Streptococcic Determination	10	25
Cream for B. Coli Determination	20	15
Plant Identification	6	0
Milk Samples for Chemical Examination	16	0
Meat Identification	6	0
Fish Identification	1	0
Hemolytic Streptococci, human ..	3	0
Bacterial Examination of Fox Viscera ..	1	0
Bacterial Examination of Eggs ..	12	0
Sub-Total.....	4,443	6,514
TOTAL.....	11,624	36,174
Total Number of Cases in Laboratory...		47,798

In addition to the regular diagnostic and advisory work done by the members of this staff in the Laboratory in the past two years, a rather large number of field investigations have been made throughout the State to assist, not only the livestock men themselves in controlling various conditions, but also to assist the various veterinarians scattered throughout the State, in making a diagnosis of some more or less obscure conditions.

In viewing the work done in the past two years by the members of the Laboratory staff, it is apparent that the major portion of the field work done has consisted of both regulatory and investigational work on Bang's disease (Infectious Abortion). This is a problem which has in the past and is at the present time, causing severe losses to the livestock industry of Montana. We know of no one single condition which

in itself is as detrimental to the profitable production of both beef and dairy herds as Bang's disease. Taking these things into consideration it would only be consistent with good economy that we should spend a large portion of our time dealing with this disease.

MILK ANALYSES

In reviewing the report of the Laboratory for the past two years there is a marked increase in the number of milk samples examined. In 1931 we established as a routine measure a most complete examination of the milk sold by the retail dairies of Montana. This examination consisted of not only the routine bacterial counting which is practised in the majority of laboratories but also of an examination first for pathogenic streptococci. These organisms are responsible in a large measure for septic sore throat, certain forms of arthritis and many other internal disorders. It was our practise when these organisms were found in a composite milk sample from any dairy to have our deputies secure under aseptic conditions individual milk samples from each animal in the herd, which were again examined and all animals eliminating these organisms in their milk were removed and isolated from the milking string and steps taken to correct the condition in these isolated animals or in milk to be used for human consumption.

Second, this examination also included a *Bacillus coli* determination which in itself is important for two main reasons. First, the *Bacillus coli* organism is of the same general group of organisms as that of typhoid fever and while we want to make it very distinct that the *Bacillus coli* is in no way responsible for typhoid fever and is not of necessity associated with the organism causing typhoid fever, nevertheless in the majority of cases the source of these two organisms in contaminated material is the same. If we can eliminate milk which is carrying *B. coli* we can also, by the same methods, eliminate possible sources of typhoid contamination. Second, this examination is important because of the fact that while the *Bacillus coli* organism is found in many cases as the normal habitant of the intestinal tract (human) when it is introduced in excessively large numbers it may result in severe infectious dysentery. This is especially true in small children or convalescents. In following this procedure we have found that a large percentage of high bacterial counts are due to the presence of *Bacillus coli* in the milk. Therefore, it is apparent that by locating the source of contamination and preventing its presence in milk we can in many cases reduce to normal otherwise high bacterial counts.

Thirdly, an examination was made of all milk received in our Laboratory for the presence of abortion agglutinins. Due to the expense involved and to the limited number of men available for this work it has been impossible for us to carry on a routine blood testing program for Bang's disease (Infectious Abortion) in all dairy herds in Montana. This examination of milk enabled us, in many herds where finances did not permit the blood testing method, to advise the owner as to the probable extent of abortion infection in his herd and it also enabled this

Department to locate the more badly infected herds and to render assistance in places where it would probably produce the greatest benefits.

While we were carrying on this method of milk analyses we were able to note a marked decrease in the bacterial counts of the milk from the various cities of Montana. We were able to note also an increase in the physical cleanliness of the milk, due in a large extent to the increased supervision and to the fact that by this method of testing we were in position to advise the dairymen as to the probable source of contaminating material in his milk. It is extremely unfortunate at the present time, due to financial conditions, it has become necessary for us to discontinue, as a routine measure, the test for streptococci, *B. coli* and abortus agglutinins.

BLACK'S DISEASE

For the past several years we have had reported and have investigated severe losses in certain farm flocks of sheep in the Bitter Root valley. These losses have not been extensive at any one time but have extended over a period of several months or years, with a loss of one or two animals at a time, which have resulted in the aggregate loss being considerable. Investigational work in this condition has been hindered due to the fact that these animals die very suddenly and show almost immediate post mortem decomposition. This was unfortunate because a diagnosis was dependent upon a bacteriological examination of the specimens. However, in the past year we have been more fortunate and have been able to observe and secure specimens almost immediately following death. This condition resembles blackleg in certain respects and because of this fact it is necessary to impress upon you that if a casual and hurried post mortem were made an improper diagnosis would probably result. This disease affects animals of all ages but appears to attack more readily animals in good flesh. We find rather consistently the following post mortem changes in Black's disease:

Dark discoloration of the musculature and subcutaneous edema. However, these two changes are not so well marked in animals posted immediately following death but manifest themselves in a few hours, probably being due in a large measure to post mortem decomposition. Hemorrhagic inflammation of the abomasum (fourth stomach) and intestinal tract; affusion of fluid in the abdominal, pleural and pericardial cavities; the last mentioned change being one of the most consistent and diagnostic features of this disease, rapid decomposition and bloating. This disease was first described by Turner of Australia, and in reporting this condition he found that at no time was this disease present where he did not have liver flukes associated. Essentially this is true of the condition observed in the Bitter Root valley, although there is certain evidence to show that liver flukes may not be always an associated condition. An organism has been isolated in this Laboratory which we feel positive is the causative factor in this disease. Vaccines have been prepared from this culture at the Veterinary Research Laboratory and are now being tested experimentally in the Bitter Root valley.

POULTRY

In the last two years there has been considerable work done with reference to the maintenance and improvement of a profitable poultry industry in Montana. We feel that with economic conditions as they are today that the poultry industry offers one means whereby many people in Montana may successfully produce a livable income. It is with this thought in mind that as far as finances have permitted we have done everything to help make the poultry industry of Montana a successful enterprise as far as the health of the individual flock is concerned. We wish to assure this industry that whenever finances are provided we are ready to carry on disease control work in poultry in a more extensive manner.

In July, 1931, a joint paper was published in the Journal of the American Veterinary Medical Association by Doctors Hadleigh Marsh, D. M. Warren and A. C. Morrow on, "A Study of the Tuberculin Sensitization of Cattle Showing Tuberculous Lesions."

A joint paper was presented at the 1932 meeting of the United States Livestock Sanitary Association at Chicago by Doctors W. J. Butler and D. M. Warren on "The Control of Bang's Disease in Range and Semi-Range Cattle."

Respectfully submitted,

D. M. WARREN,

Bacteriologist-Pathologist.

State Veterinary Surgeon
REPORT OF THE CHEMIST
of the
Montana Livestock Sanitary Board

During the biennium just past two thousand and three samples have been examined in this Laboratory, one thousand five hundred and ninety-nine of this number consisted of milk and cream samples submitted by inspectors authorized by the Livestock Sanitary Board. These samples were taken directly from retail milk wagons, dairies, creameries and retail stores and were analyzed in this Laboratory for butter fat, solids, sediment and preservatives. One hundred samples of milk and cream were brought to the Laboratory by milk dealers and consumers. These samples have been analyzed free of charge and without prejudice, and the results have been interpreted to the person submitting the sample with an endeavor to aid the producer and consumer alike in the production and purchasing of wholesome milk products.

With few exceptions, the milk and cream samples examined have been found to conform to the standards adopted by the Livestock Sanitary Board. There is, however, always room for improvement and it has been the experience of this Department that frequent inspection of dairies and laboratory examinations of dairy products are necessary in order to keep the attention of the producer focused on the necessity of the proper handling of dairy food products.

Three hundred and four samples of a miscellaneous nature have also been received directly from stockmen, farmers, veterinarians and public officials. These samples consist of a great variety of specimens for examination including examination of stomach contents and animal tissues for various kinds of poisons, examinations of water in order to determine its fitness for livestock watering purposes, examination of livestock food products, examination of suspected poisons, identification of weeds and their examination for poisonous ingredients, examination of crude oil for emulsifying purposes, mineral examination of bones for the diagnosis of mineral deficiency and the examination of stock medicines, germicides, etc.

Several cases of livestock poisoning have again come to the attention of this Laboratory. The principal stock losses by poisoning have been accidental or caused by the careless use of arsenical insecticides, and strychnine rodent poisons, while a few cases of poisoning by copper, lead and cyanide have been noted.

Many cases of plant poisoning have been reported to us. Some of these cases have been caused by plant poisons which were identified in the plant and in the stomach contents, such as oxalates from grease wood and mangle and sugar beet tops and also from hydrocyanic acid found in wilted flax and sugar cane leaves.

A large number of cases of canine poisoning by strychnine, apparently with a malicious intent, have been brought to our attention.

In some sections of the State the shortage of water and poor water supplies have caused much loss and sickness of livestock. Laboratory examinations of such waters have been made in many cases and the water found to be unfit for livestock use. It is felt by this Department that a field examination of the stock water in the prairie sections of the State would reveal many cases of the use of poor stock water and be of material value to the stockmen in those sections.

It has been the aim of this Department to assist the stockmen and farmers in every way possible and to make a quick and thorough examination of each specimen submitted with a view, especially in the poisoning cases, to determine the cause of the loss and prevent more unnecessary losses.

The following list gives the material and nature of examinations conducted in this Laboratory during the period from December 1st, 1930 to November 30th, 1932, inclusive.

REPORT OF THE CHEMICAL LABORATORY December 1, 1930 to November 30, 1932

Lab. No.	Specimen and Nature of Examination	Result
1006	Solution Acriflavine for chemical analysis.....	
1007	Stomach contents of horse for poisons.....	Negative
1008	Water for mineral analysis.....	
1009	Water for mineral analysis.....	
1010	Sheep bones for chemical analysis.....	
1011A	Stomach contents of horse for poison.....	Negative
1011B	Stomach contents of horse for poison.....	Negative
1012	Sample of sheep urine for analysis.....	
1013A	Suspected poison for analysis.....	Arsenic
1013B	Stomach contents of cow for poison.....	Arsenic
1014	Stomach contents of hog for poison.....	Arsenic
1015	Bovine stomach contents for poison.....	Negative
1016A	Sample of oat hay for poisons.....	Negative
1016B	Sample of sheep urine for analysis.....	
1017	Sample of liver for arsenic test.....	Negative
1018	Stomach contents of cow for arsenic.....	Negative
1019A	Suspected poisoned oats for analysis.....	Arsenic
1019B	Stomach contents of cow for poison.....	Arsenic
1020	Capsules for poison analysis.....	Strychnine
1021	Stomach contents of hogs for poisons.....	Negative
1022	Alfalfa hay for arsenic analysis.....	Negative
1023A	Ground feed for poison analysis.....	Negative
1023B	Stomach contents of hog for poison.....	Negative
1024	Water for mineral analysis.....	

1025A	Ground feed for poison analysis.....	Negative
1025B	Ground feed for poison analysis.....	Negative
1025C	Ground feed for poison analysis.....	Negative
1026	Suspected poison liquid for analysis.....	Pot. Cyanide
1027A	Wheat for poison analysis.....	Negative
1027B	Paper for poison analysis.....	Negative
1028	Stomach contents of calf for poison.....	Negative
1029	Hay for cyanide test.....	Negative
1030	Chicken bones for analysis.....	
1031	Water for mineral analysis.....	
1032	Urinary calculus for analysis.....	
1033	Stomach contents of dog for poison.....	Strychnine
1034	Bovine stomach contents for poison.....	Negative
1035	Bovine stomach contents for poison.....	Negative
1036	Bovine stomach contents for poison.....	Negative
1037	Sample of stock feed for analysis.....	
1038	Bovine stomach contents for analysis.....	Negative
1039	Milk for chemical analysis.....	
1040	Stomach contents of cow for poisons.....	Negative
1041	Water for mineral analysis.....	
1042	Bovine stomach contents for poisons.....	Negative
1043	Stomach contents and liver of cow for poisons.....	Negative
1044	Wheat for poison analysis.....	Copper
1045	Stomach contents of sheep for poisons.....	Negative
1046	Ground feed for poison analysis.....	Negative
1047	Stomach contents of cow for poisons.....	Arsenic
1048	Stomach contents of cow for poisons.....	Lead
1049	Unknown substance for chemical analysis.....	Common Salt
1050	Stomach contents of calf for poisons.....	Arsenic
1051	Fig pulp for poison analysis.....	Negative
1052	White powder for chemical analysis.....	
1053	Stomach contents of dog for poisons.....	Strychnine
1054	Stomach contents of dog for poisons.....	Negative
1055	Beet pulp for poison analysis.....	Negative
1056	Water for chemical analysis.....	
1057	Stomach contents of sheep for poisons.....	Negative
1058	Stomach contents of hog for poisons.....	Negative
1059	Two samples of water for fitness for livestock.....	
1060	Sample of water for fitness for livestock.....	
1061	Sample of water for mineral analysis.....	
1062	Crude oil for emulsifying purposes.....	
1063	Salt for chemical analysis.....	
1064	Stomach contents of sheep for poisons.....	Negative
1065	Water for chemical analysis.....	
1066	Urinary calculi for analysis.....	
1067	Suspected poison for analysis.....	Sodium Nitrate
1068	Oil cake for analysis.....	
1069	Stomach contents of horse for poisons.....	Negative
1070	Sample of meat for poison analysis.....	Negative

Lab. No.	Specimen and Nature of Examination	Result
1071	Sample of urine for analysis.....	
1072	Depilatory for analysis.....	
1073	Stomach contents of calf for strychnine.....	Negative
1074	Stomach contents of cow for strychnine.....	Negative
1075	Stomach contents of dog for poison.....	Strychnine
1076	Stomach contents of horse for poisons.....	Strychnine
1077	Water for mineral analysis.....	
1078	Water for mineral analysis.....	
1079	Three samples of water for mineral analysis.....	
1080	Stomach contents of cow for poison.....	Lead
1081	Bovine stomach contents for poisons.....	Negative
1082	Oats for strychnine analysis.....	Positive
1083	Bovine stomach contents for poisons.....	Negative
1084	Bovine stomach contents for poisons.....	Negative
1085A	Bovine stomach contents for poisons.....	Negative
1085B	Stomach contents of hog for poisons.....	Negative
1086	Stomach contents of dog for poisons.....	Negative
1087	Water for mineral analysis.....	
1088	Mineral stock feed for analysis.....	
1089	Water for chemical analysis.....	
1090	Water for mineral analysis.....	
1091A	Sample of dirt for poisons.....	Negative
1091B	Sample of dirt for poisons.....	Negative
1091C	Sample of bovine stomach contents for poisons.....	Negative
1092A	Sample of dirt for poisons.....	Negative
1092B	Bovine stomach contents for poisons.....	Negative
1093	Bovine stomach contents for poisons.....	Negative
1094	Water for mineral analysis.....	
1095	Suspected poison for analysis.....	Lead Arsenate
1096	Bovine stomach contents for strychnine.....	Negative
1097	Bovine stomach contents for poisons.....	Negative
1098	Stomach contents of cow for poisons.....	Lead
1099	Salt for chemical analysis.....	
1100A	Stomach contents of sheep for poisons.....	Negative
1100B	Stock salt for poisons.....	Negative
1101	Stomach contents of dog for poisons.....	Strychnine
1102	Bone meal for analysis.....	
1103	Grease wood leaves for oxalates.....	Positive
1104	Stomach contents of cow for poisons.....	Lead
1105	Stomach contents of sheep for poisons.....	Negative
1106	Medicine for analysis.....	
1107	Stomach tissues and liver of sheep for poisons.....	Negative
1108	Bovine stomach for poisons.....	Negative
1109	Stomach contents of cat for poisons.....	Negative
1110	Stomach contents of sheep for poisons.....	Negative
1111	Stomach contents of steer for poisons.....	Strychnine
1112	Foot rot medicine for analysis.....	
1113	Stomach contents of sheep for poisons.....	Negative

Lab. No.	Specimen and Nature of Examination	Result
1114	Oats for strychnine test.....	Positive
1115	Meat for poison analysis.....	Negative
1116	Ground feed for poisons.....	Strychnine
1117	Farm disinfectant for analysis.....	
1118	Alkali salt from lake bed for analysis.....	
1119	Stomach contents of cow for poisons.....	Negative
1120	Two samples of water for mineral analysis.....	
1121	Water for mineral analysis.....	
1122	Stomach contents of cow for poisons.....	Arsenic
1123	Stomach contents of sheep for poisons.....	Negative
1124	Bovine stomach contents for poisons.....	Negative
1125	Bovine stomach contents for poisons.....	Negative
1126	Bovine stomach contents and liver for poisons.....	Negative
1127	Sample of grass for poison analysis.....	Negative
1128	Stomach contents of sheep for poison.....	Negative
1129A	Weed for identification and Prussic acid.....	Negative
1129B	Bovine stomach contents for poisons.....	Negative
1130	Bovine stomach contents for poisons.....	Negative
1131	Water for mineral analysis.....	
1132A	Stomach contents of cow for poisons.....	Arsenic
1132B	Water for poison analysis.....	Negative
1133	Stomach contents of antelope for poison.....	Negative
1134	Sugar cane stalks and leaves for Prussic acid.....	Positive
1135	Oats for poison analysis.....	Negative
1136	Stomach contents of cow for poisons.....	Negative
1137	Water for mineral analysis.....	
1138	Four samples of water for mineral analysis.....	
1139	Milk for chemical analysis.....	
1140A	Stomach contents of cow for poisons.....	Negative
1140B	Five samples of suspected poison.....	Sodium Cyanide
1141	Water for mineral analysis.....	
1142	Stomach contents of pig for poisons.....	Negative
1143	Cotton seed cake for analysis.....	
1144	Water for chemical analysis.....	
1145	Salt for poison analysis.....	Negative
1146	Crop from turkey for poison analysis.....	Arsenic
1147	Bovine stomach contents for poisons.....	Arsenic
1148	Stomach contents and tissues from cow for poisons.....	Negative
1149	Stomach contents of sheep for poisons.....	Arsenic
1150	Stomach contents of cat for poisons.....	Negative
1151	Three samples of bovine stomach contents for poisons.....	Negative
1152	Cream to be tested for preservatives.....	Negative
1153	Water for mineral analysis.....	
1154	Water for mineral analysis.....	
1155	Stomach contents of cow for poisons.....	Oxalic Acid
1156	Stomach contents of sheep for poisons.....	Negative
1157	Meat for poison analysis.....	Negative
1160	Bovine stomach contents for poisons.....	Negative

Lab. No.	Specimen and Nature of Examination	Result
1161	Water for mineral analysis.....	
1162	Stomach contents of pig for poisons.....	Negative
1163	Crop and gizzard of prairie chicken for poison.....	Negative
1164	Water for mineral analysis.....	
1165	Water for mineral analysis.....	
1166	Stomach contents of pig for poisons.....	Negative
1167	Water for mineral analysis.....	
1168	Bovine stomach contents for poisons.....	Negative
1169	Crude oil for emulsifying tests.....	
1170	Water for mineral analysis.....	
1171	Bovine stomach contents for arsenic.....	Negative
1172	Stomach contents of sheep for poisons.....	Negative
1173	Two samples of bovine stomach contents for poisons.....	Negative
1174	Stomach contents of calf for poisons.....	Negative
1175	Bovine stomach contents for poisons.....	Negative
1176	Water for mineral analysis.....	
1177	Bovine stomach contents for poisons.....	Arsenic
1178	Milk for chemical analysis for preservatives.....	Negative
1179	Vermifuge powder for chemical analysis.....	
1180	Hay for cyanide analysis.....	Negative
1181	Water for mineral analysis.....	
1182	Stomach contents of dog for struchmine.....	Positive
1183	Stomach contents of dog for strychnine.....	Positive
1184	Tissues from pigs and pig feed for poisons.....	Negative
1185	Bovine stomach tissues for poisons.....	Lead
1186	Mineral stock feed for chemical analysis.....	
1187	Liver and stomach contents from pig for poisons.....	Negative
1188	Bovine stomach contents for poisons.....	Lead
1189	Stomach contents for poisons of dog.....	Strychnine
1190	Sample of meat for poison.....	Strychnine
1191	Bovine stomach contents for poisons.....	Negative
1192A	Canned fish food for chemical analysis.....	
1192B	Canned fish food for chemical analysis.....	
1193	Fox food tonic for analysis.....	
1194	Stomach contents of calves for poisons.....	Negative
1195	Bovine stomach contents for poisons.....	Negative
1196A	Fish food for chemical analysis.....	
1196B	Fish food for chemical analysis.....	
1196C	Fish food for chemical analysis.....	
1197	Stomach tissues of cow for poisons.....	Negative
1198	Stomach contents of cow for poisons.....	Negative
1199	Meat for poison analysis.....	Negative
1200	Contents of crop of chicken for poison.....	Negative
1201	Stomach contents of pig for poisons.....	Negative
1202	Bovine stomach contents for poisons.....	Negative
1203	Bovine stomach contents and organs for poisons.....	Arsenic
1204	Research on bovine absorption of arsenic.....	
1205	Stock salt for poisons.....	Negative

Lab. No.	Specimen and Nature of Examination	Result
1206	Bovine stomach contents for poisons.....	Negative
1207	Stock feed for poison analysis.....	Negative
1208	Stomach contents of calf for poisons.....	Negative
1209	Meat for poison analysis.....	Positive
1210	Stock salt for chemical analysis.....	
1211	Two samples of washing powder for analysis.....	
1212	Four samples of hypochlorite solution for analysis.....	
1213	Stomach contents of sheep for poison.....	Negative
1214	Sample of meat for poisons.....	Strychnine
1215	Bovine stomach contents for poisons.....	Negative
1216A	Bovine stomach contents for poisons.....	Arsenic
1216B	Bovine stomach contents for poisons.....	Arsenic
1217	Hypochlorite solution for analysis.....	
1218	Stomach contents of horse for poisons.....	Strychnine
1219	Sample of hay for poisons.....	Copper Arsenic
1220	Water for mineral analysis.....	
1221	Crop of turkey for poisons.....	Strychnine
1222A	Stomach contents of dog for poisons.....	Negative
1222B	Stomach contents of sheep for poisons.....	Negative
1223	Bovine stomach contents for arsenic.....	Negative
1224	Bovine stomach contents for poisons.....	Strychnine
1225	Stomach contents of horse for strychnine.....	Negative
1226	Analysis of crude oil for emulsifying purposes.....	
1227	Stomach contents of pig for poisons.....	Strychnine
1228	Oats for poison analysis.....	Strychnine
1229	Stomach contents of dog for poisons.....	Strychnine
1230	Stomach contents of dogs for poisons.....	Strychnine
1231	Stomach contents of dog for poisons.....	Strychnine
1232	Stomach contents of horse for poisons.....	Negative
1233	Stomach contents of lamb for poisons.....	Negative
1234	Bovine stomach contents for poisons.....	Negative
1235A	Stomach contents of horses for poisons.....	Negative
1235B	Oats suspected of containing poison.....	Negative
1236	Bovine stomach contents for analysis.....	Cyanide
1237	Stomach contents of sheep for poisons.....	Negative
1238	Stomach contents of sheep for poisons.....	Negative
1239	Stomach contents of dog for poisons.....	Strychnine
1240	Stomach contents of horse for arsenic.....	Negative
1241	Stomach contents of moose for poisons.....	Negative
1242	Bovine stomach contents for poisons.....	Arsenic
1243	Water for mineral analysis.....	
1244	Bovine stomach contents for poisons.....	Negative
1245A	Water for poison analysis.....	Negative
1245B	Stomach contents of calf for poison.....	Negative
1246	Wheat for poison analysis.....	Negative
1247	Water for mineral analysis.....	
1248	Hypochlorite solution for analysis.....	
1249	Bovine stomach contents for poisons.....	Negative

Lab. No.	Specimen and Nature of Examination	Result
1250	Stomach contents of dog for poisons.....	Strychnine
1251	Bovine stomach contents for poisons.....	Arsenic
1252	Stomach contents of dog for poisons.....	Strychnine
1253	Stomach contents of cow for poisons.....	Arsenic
1254	Bovine stomach contents for poisons.....	Negative
1255	Stomach contents of calf for poisons.....	Negative
1256	Water for mineral analysis.....	
1257	Three samples of compressed stock food for analysis.....	
1258A	Ten samples of mill tailings for cyanide analysis.....	Negative
1258B	Water for poison analysis.....	Negative
1259	Hypochlorite solution for analysis.....	
1260	Bovine stomach contents for poison analysis.....	Negative
1261	Stomach contents of dog for poisons.....	Strychnine
1262	Stomach contents of sheep for alkali poisoning.....	Negative
1263A	Oats for poison analysis.....	Strychnine
1263B	Bovine stomach contents for poisons.....	Strychnine
1264	Sample of meat for poisons.....	Negative
1265	Stomach contents of sheep for poison.....	Negative
1266	Bovine stomach contents for poison.....	Arsenic
1267	Three samples of water for mineral analysis.....	
1268	Stomach contents of cat for poison.....	Negative
1269	Bovine stomach contents for poisons.....	Negative
1270A	Two jars of stomach contents of pigs for poison.....	Strychnine
1270B	Sample of oats for poisons.....	Strychnine
1271	Two samples of stomach contents of pigs for poison.....	Negative
1272	Stomach contents of lamb for poisons.....	Negative
1273	Contents of crops of chickens for poisons.....	Negative
1274	Bovine stomach contents for poisons.....	Negative
1275	Water for strychnine examination.....	Positive
1276	Bovine stomach contents for poisons.....	Negative
1277	Two samples of meat for poisons.....	Strychnine
1278	Oxalate analysis of grease wood leaves.....	
1279	Soap for Titer test.....	
1280	Stomach contents of dog for poisons.....	Strychnine
1281	Bovine stomach contents for arsenic.....	Negative
1282	Two samples of milk for preservatives.....	Negative
1283	Sample of milk for poisons.....	Negative
1284	Paraffin for poisons.....	Negative
1285	Beef suet for chemical examination for adulteration.....	
1286	Bovine stomach contents for poisons.....	Negative
1287	Bovine stomach contents for poisons.....	Negative
1288	Butter for chemical analysis.....	
1289	Two samples of bone for chemical analysis.....	
1290	Bovine stomach contents for poisons.....	Negative
1291A	Bovine stomach contents for poisons.....	Blasting Powder
1291B	Black powder suspected of containing poison.....	Blasting powder
1292	Stomach contents of calf for poisons.....	Negative
1293	Bovine stomach contents for poisons.....	Lead

Lab. No.	Specimen and Nature of Examination	Result
1294	Contents of crops of chickens for poisons.....	Strychnine
1295	Sugar beet tops for poison analysis.....	Negative
1296	Two jars of bovine stomach contents for poisons.....	Arsenic
1297A	Stomach contents of cow for poisons.....	Negative
1297B	Mangle tops for oxalic acid.....	Positive
1298	Hay for poison analysis.....	Negative
1299	Research on sugar beet tops for oxalates.....	
1300	Bovine stomach contents for poisons.....	Negative
1301A	Bovine stomach contents for poisons.....	Hydrocyanic Acid
1301B	Flax for poison analysis.....	Hydrocyanic Acid
1302	Bovine stomach contents for poisons.....	Arsenic
1303	Stomach contents of a horse for poison.....	Negative
1304	Water for mineral analysis.....	
1305	Stomach contents of a horse for poisons.....	Negative
1306	Two samples of stomach contents of horses for poisons...	Negative
1307	Native alkali salt for analysis.....	
1308	Ground feed mash for poisons.....	Negative
1309	Prepared dog feed for analysis.....	

ANALYSIS OF MILK AND CREAM SAMPLES

From Dec. 1, 1930 to Nov. 30, 1932

1,599 Official samples of milk and cream.

100 Unofficial samples of milk and cream.

Respectfully submitted,

VIRGIL A. WILLSON,

Chemist.

INVESTIGATIONS SYNOPTICALLY ARRANGED**Including Cooperative Work with the United States Bureau of
Animal Industry****HORSES****Dourine, 1931**

Number of horses blood tested.....	1
Number reacting to test.....	None

Dourine, 1932

Number of horses blood tested.....	1
Number reacting to test.....	None

Glanders, 1931

Number of horses reported and suspected of being affected with glanders, mallein tested.....	79
Number reacting to test.....	None

Glanders, 1932

Number of horses reported and suspected of being affected with glanders, mallein tested.....	367
Number reacting to test.....	None

Miscellaneous Inspections, 1931

Number of horses inspected for miscellaneous diseases.....	131
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Miscellaneous Inspections, 1932

Number of horses inspected for miscellaneous diseases.....	1,775
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Scabies, 1931

*Number of horses inspected for scabies.....	5,032
Number infected	48
Number of horses dipped for scabies, 1st, 2nd and 3rd dippings....	None
(*Blackfeet Indian Reservation)	

Scabies, 1932

*Number of horses inspected for scabies.....	3,587
Number infected	50
Number of horses dipped for scabies, 1st, 2nd and 3rd dippings.....	4,931
(*Blackfeet Indian Reservation)	

Importation Inspections, 1931

Number of horses clinically inspected and mallein tested at destination	81
Number reacting to test.....	None

Importation Inspections, 1932

Number of horses clinically inspected and mallein tested at destination	20
Number reacting to test.....	None
Number of horses clinically inspected at destination shipped for immediate slaughter.....	3,464

Tested and Inspected at Port of Entry, 1931

Number of horses clinically inspected and mallein tested at port of entry.....	99
Number reacting to test	None
Number of horses clinically inspected at port of entry.....	75
Number of horses clinically inspected at port of entry shipped for immediate slaughter.....	7,422

Tested and Inspected at Port of Entry, 1932

Number of horses clinically inspected and mallein tested at port of entry.....	6
Number reacting to test	None
Number of horses clinically inspected at port of entry.....	None

Inspections for Interstate Shipment, 1931

Number of horses mallein tested for interstate shipment.....	6,455
Number reacting to test.....	None
Number of horses clinically inspected.....	6,269
Number of horses inspected, 1931.....	25,635

Inspections for Interstate Shipment, 1932

Number of horses mallein tested for interstate shipment.....	5,465
Number reacting to test.....	None
Number of horses clinically inspected.....	876
Number of horses inspected, 1932.....	20,492
Number of horses inspected, 1931.....	25,635
Number of horses inspected, 1932.....	20,492
TOTAL NUMBER OF HORSES INSPECTED, 1931 AND 1932.....	46,127

CATTLE**Tuberculosis, 1931**

Number of dairy cattle tested for tuberculosis.....	15,107
Number reacting to test.....	29
Percentage of reactors.....	.0019
Number of other cattle tested.....	118,969
Number reacting to test.....	288
Percentage of reactors.....	.0024

Tuberculosis, 1932

Number of dairy cattle tested for tuberculosis.....	33,040
Number reacting to test.....	40
Percentage of reactors.....	.0012
Number of other cattle tested.....	42,366
Number reacting to test.....	77
Percentage of reactors.....	.0018

Accredited Tuberculosis Free Herds, 1931

Number of cattle tested for accredited herds.....	4,782
Number reacting to test.....	None

Accredited Tuberculosis Free Herds, 1932

Number of cattle tested for accredited herds.....	5,128
Number reacting to test.....	None

Retests of Imported Cattle, 1931

Sixty-Ninety day tests.....	930
Number reacting to test.....	None

Retests of Imported Cattle, 1932

Sixty-ninety day tests.....	251
Number reacting to test.....	None

Cattle Tested at Port of Entry, 1931

Number of cattle tested at port of entry.....	4
Number reacting to test.....	None

Cattle Tested at Port of Entry, 1932

Number of cattle tested at port of entry.....	None
Number reacting to test.....	None
Number of cattle tested at destination.....	359
Number reacting to test.....	None

Tests for Interstate Shipment, 1931

Number of cattle tested for shipment.....	3,061
Number reacting to test.....	None

Tests for Interstate Shipment, 1932

Number of cattle tested for shipment.....	1,505
Number reacting to test.....	None
Total number of cattle tested for tuberculosis, 1931.....	142,853
Number reacting to test.....	317
Percentage of reactors.....	.0022
Total number of cattle tested for tuberculosis, 1932.....	82,649
Number reacting to test.....	117
Percentage of reactors.....	.0014
TOTAL NUMBER OF CATTLE TESTED FOR TUBERCULOSIS, 1931 AND 1932.....	225,502
TOTAL NUMBER OF REACTORS.....	434
PERCENTAGE OF REACTORS, 1931.....	.0022
PERCENTAGE OF REACTORS, 1932.....	.0014

Cattle Scabies, 1931

*Number of cattle inspected for scabies.....	73,484
Number of cattle inspected and dipped, including 1st, 2nd and 3rd dippings..... (*Crow Indian Reservation)	8,716
Number of cattle inspected for scabies, exclusive of Crow Indian reservation.....	109,899
Number of cattle inspected and dipped, including 1st, 2nd, 3rd and 4th dippings.....	1,635

Cattle Scabies, 1932

*Number of cattle inspected for scabies.....	74,581
Number of cattle inspected and dipped, including 1st and 2nd dippings..... (*Crow Indian Reservation)	14,340

Number of cattle inspected for scabies, exclusive of Crow Indian reservation.....	101,907
Number of cattle inspected and dipped, exclusive of Crow Indian reservation, including 1st, 2nd, 3rd and 4th dippings.....	20,172

Miscellaneous Cattle Inspections, 1931

Number of cattle inspected for miscellaneous diseases.....	37,140
Number of cattle blood tested for contagious abortion.....	16,873

Miscellaneous Cattle Inspections, 1932

Number of cattle inspected for miscellaneous diseases.....	31,885
Number of cattle blood tested for contagious abortion.....	19,076

Cattle Inspected at Port of Entry, 1931

Number of cattle clinically inspected at Port of Entry.....	149
Number of cattle clinically inspected upon arrival in State.....	1,074

Cattle Inspected at Port of Entry, 1932

Number of cattle clinically inspected at Port of Entry.....	4
Number of cattle clinically inspected upon arrival in State.....	756

Inspections for Interstate Shipments, 1931

Number of cattle clinically inspected for interstate shipment.....	29,571
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Inspections for Interstate Shipments, 1932

Number of cattle clinically inspected for interstate shipment.....	10,932
TOTAL NUMBER OF CATTLE INSPECTED 1931.....	261,668
TOTAL NUMBER OF CATTLE INSPECTED 1932.....	254,577
TOTAL NUMBER OF CATTLE INSPECTED 1931 and 1932.....	516,245

SHEEP**Scabies and Miscellaneous Diseases, 1931**

Number of sheep inspected for scabies and miscellaneous diseases.....	553,602
Number found affected with scabies.....	None

Scabies and Miscellaneous Diseases, 1932

Number of sheep inspected for scabies and miscellaneous diseases.....	568,243
Number found affected with scabies.....	None

Importation Inspections, 1931

Number of sheep inspected and quarantined.....	178,656
Number of sheep dipped and quarantined including 1st and 2nd dippings.....	None
Reinspection Imported Sheep.....	88,908
Number of sheep inspected at Port of Entry.....	None

Importation Inspections, 1932

Number of sheep inspected and quarantined.....	152,020
Number of sheep dipped and quarantined including 1st and 2nd dippings.....	None
Reinspection Imported Sheep.....	124,800
Number of sheep inspected at Port of Entry.....	17

Inspections for Interstate Shipment, 1931

Number of sheep inspected for interstate shipment.....	1,190,701
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Inspections for Interstate Shipment, 1932

Number of sheep inspected for interstate shipment.....	706,434
Number of sheep inspections 1931.....	2,011,867
Number of sheep inspections 1932.....	1,551,514
TOTAL NUMBER OF SHEEP INSPECTED, 1931 and 1932.....	3,563,381
Number of goats inspected for interstate shipment.....	5

SWINE, 1931

Number of swine inspected for various diseases including	
Hog Cholera.....	9,798
Number of premises infected with Hog Cholera.....	13
Number of swine inspected at Port of Entry.....	13
Number of swine inspected for interstate shipment.....	1,980

Swine, 1932

Number of swine inspected for various diseases including	
Hog Cholera.....	3,005
Number of premises infected with Hog Cholera.....	9
Number of swine inspected at Port of Entry.....	11
Number of swine inspected for interstate shipment.....	179
Total number of swine inspected 1931.....	11,791
Total number of swine inspected 1932.....	3,195
Total number of swine inspected 1931 and 1932.....	14,986

POULTRY, 1931

Number of fowls inspected for tuberculosis and various diseases	186,552
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Poultry, 1932

Number of fowls inspected for tuberculosis and various diseases	73,162
Total number of fowls inspected 1931 and 1932.....	259,711

DOGS, 1931

Number of dogs inspected for various diseases.....	704
Number suffering from rabies.....	None
Number inspected for interstate shipment.....	369

Dogs, 1932

Number of dogs inspected for various diseases.....	13
Number suffering from rabies.....	None
Number inspected for interstate shipment.....	200
Total number of dogs inspected 1931 and 1932.....	1,286

GAME AND FUR BEARING ANIMALS, 1931

Number of animals inspected for various diseases.....	68
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Game and Fur Bearing Animals, 1932

Number of animals inspected for various diseases.....	None
Total Number of Animals Inspected, 1931.....	2,312,103
Total Number of Animals Inspected, 1932.....	1,829,995
Total Number of Animals Inspected, 1931 and 1932.....	4,142,098

MEAT INSPECTIONS, 1931

Number of carcasses inspected.....	11,486
Number of carcasses condemned.....	9

Meat Inspections, 1932

Number of carcasses inspected.....	11,638
Number of carcasses condemned.....	9
Total Number of Meat Inspections, 1931 and 1932.....	23,124
Total Number of Carcasses Condemned, 1931 and 1932.....	18

GRAND TOTALS

Total Number of Animals Inspected, 1931 and 1932.....	4,142,098
Total Number of Fowls Inspected, 1931 and 1932.....	259,714
Total Number of Meat Inspections, 1931 and 1932.....	23,124
TOTAL NUMBER OF INSPECTIONS, 1931 and 1932.....	4,424,936
Total Number of Cattle Blood Tested, 1931 and 1932.....	35,949

MILES TRAVELED BY DISTRICT DEPUTIES AND SHEEP INSPECTORS

	Auto	Railway	Foot	Horseback	Team	
1931.....	137,685	4,086	12	80	31	
1932.....	152,545	2,287	13	284	74	
Total.....	290,230	6,373	25	364	105	297,047

ESTIMATED NUMBER OF MILES TRAVELED BY RESIDENT DEPUTIES

	Auto	
1931.....	35,000	
1932.....	25,252	
Total.....	60,262	60,252
NUMBER OF MILES TRAVELED, 1931 and 1932.....		357,299

IMPORTATIONS FOR 1931 AND 1932

STATE	No. of Certificate		Horses		Cattle		Sheep		Swine		Dogs	
	1931	1932	1931	1932	1931	1932	1931	1932	1931	1932	1931	1932
Alabama	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Arizona	3	1	.....	.....	.....	.....	.....	.....	.....	.....	7	1
Arkansas	1	6	.....	.....	.....	.....	.....	.....	.....	.....	1	2
California	8	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Canada	55	46	146	26	84	50	71	1	12	.....	.....	.....
Colorado	18	33	.....	2,604	8	.....	.....	.....	.....	.....	.....	.....
Idaho	79	32	64	426	469	91	22,326	9,651	11	.....	12	9
Illinois	27	35	62	30	15	2	.....	.....	.....	.....	16	27
Indiana	.....	2	.....	3	.....	.....	.....	.....	.....	.....	19	2
Iowa	15	5	6	.....	33	3	.....	.....	3	.....	.....	.....
Kansas	6	6	.....	.....	.....	2	.....	.....	2	.....	3	2
Kentucky	3	.....	11	.....	.....	.....	***1	.....	.....	.....	3	2
Massachusetts	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....
Michigan	2	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
Minnesota	45	1	3	22	61	27	.....	.....	10	.....	2	.....
Missouri	18	6	10	.....	20	137	.....	.....	18	.....	22	18
Nebraska	18	12	.....	.....	87	1	.....	.....	2	.....	9	5
Nevada	7	.....	79	.....	.....	287	.....	.....	5	.....	13	3
New Mexico	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	2	.....
North Dakota	48	39	79	22	117	262	283	12,913	880	6	.....	1
Ohio	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	11	5
Oregon	3	1	.....	.....	.....	.....	.....	.....	.....	.....	3	1
Pennsylvania	79	45	.....	1	135	66	48,198	16,482	3	33	14	18
South Dakota	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Texas	87	48	161	88	53	125	3,763	19,318	5	3	11	7
Tennessee	.....	1	.....	.....	.....	13	.....	.....	.....	.....	.....	.....
Utah	6	4	.....	.....	32	.....	.....	.....	55	1	4	3
Vermont	37	8	31	.....	120	.....	.....	.....	.....	.....	24	7
Washington	102	80	143	132	215	42	2,898	89	2	1	119	71
Wisconsin	45	7	.....	.....	126	61	96,442	60,679	260	.....	.....	.....
Wyoming	46	33	35	76	2,492	686	4,955	8,534	346	.....	2	4
TOTAL	763	500	831	3,431	4,068	1,849	178,937	127,667	1,596	86	367	205
GRAND TOTAL	1,263	.....	4,262	.....	5,917	.....	306,604	.....	1,682	.....	572	.....

***1 goat

